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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/725,500

12/03/2003

Joseph F. Brooks

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EXAMINER

HOANG, QUOC DINH

ART UNIT

PAPER NUMBER

2892

MAIL DATE

DELIVERY MODE

07/31/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/725,500	Applicant(s) BROOKS ET AL.	
	Examiner QUOC D. HOANG	Art Unit 2892	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-59 is/are pending in the application.
- 4a) Of the above claim(s) 30-59 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Amendment filed on 04/28/2008 has been entered. In Amendment, claims 1-20 have been cancelled. Claims 21-59 are pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 21-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art in view of Young., (US Pat No. 7,074,709).

Regarding claim 21, AAPA teaches an electrode structure, comprising:

a first conductive layer (102) ([0025]-[0029] and Fig. 2);

a dielectric layer (104) over said first conductive layer, said dielectric having an opening exposing a portion of said first conductive layer ([0025]-[0029] and Fig. 2);

an adhesion layer (110) in said opening of said dielectric layer and over said exposed portion of said first conductive layer ([0025]-[0029] and Fig. 2);

a second conductive layer (112) formed at least partially over said adhesion layer, wherein said second conductive layer and said adhesion layer are recessed within said opening in said dielectric layer ([0025]-[0029] and Fig. 2); and

a third conductive layer (210) formed over and at least partially in contact with said second conductive layer and said adhesion layer within said opening, wherein the third conductive layer is recessed within the opening to cap the second conductive layer and said adhesion layer within said opening ([0025]- [0029] and Fig. 2). Noted that the third conductive layer could be in electrical contact with the second conductive layer through the memory layer (200) formed in between the first and second conductive layer (see Fig. 2).

AAPA teaches the third conductive layer (210), but does not teach the third conductive layer is in direct physical contact with the second conductive layer and the adhesion layer within the opening.

However, Young teaches the third conductive layer (38) is in direct physical contact with the second conductive layer (34) and the adhesion layer (36) within the opening (col. 7, lines 20-35 and Fig. 3A). Since AAPA and Young are all from the same field of endeavor, the purpose disclosed by Young would have been recognized in the pertinent art of AAPA. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to form a third conductive layer in direct physical contact with the second conductive layer and the adhesion layer in order to obtain an electrical connection between second interconnection and the via as taught by Young, column 7, lines 20-35.

Regarding claim 22, AAPA teaches wherein said third conductive layer 210 is planarized such that a top surface of said layers is substantially level with a top surface of said dielectric layer ([0025]-[0029] and Fig. 2).

Regarding claim 23, AAPA teaches wherein said third conductive layer 210 is patterned ([0025]-[0029] and Fig. 2).

Regarding claim 24, AAPA teaches wherein said adhesion layer 110 comprises an oxide or a nitride ([0025] and Fig. 2).

Regarding claim 25, AAPA teaches wherein said adhesion layer 110 comprises titanium nitride ([0025] and Fig. 2).

Regarding claim 26, AAPA teaches wherein said first conductive layer 102 comprises at least one of the group consisting of tungsten, nickel, tantalum, aluminum, platinum, and conductive nitrides ([0025] and Fig. 2).

Regarding claim 27, AAPA teaches wherein said second conductive layer 112 comprises tungsten ([0025] and Fig. 2).

Regarding claim 28, AAPA teaches the third conductive layer (210), but does not teach wherein said third conductive layer is formed from a same material as the first conductive material.

However, Young teaches wherein the third conductive layer (38) is formed from a same material as the first conductive material (30) (col. 7, lines 20-22 and Fig. 6). Since AAPA and Young are all from the same field of endeavor, the purpose disclosed by Young would have been recognized in the pertinent art of AAPA. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to use same conductive material of the first and third conductive layer in order to obtain a high conductivity of the interconnects.

Regarding claim 29, AAPA teaches the third conductive layer (210), but does not teach wherein said third conductive layer is formed from a same material as the second conductive material.

However, Young teaches wherein said third conductive layer is formed from a same material as the second conductive material (col. 6, line 23 through col. 7, line 32 and Fig. 6). Since AAPA and Young are all from the same field of endeavor, the purpose disclosed by Young would have been recognized in the pertinent art of AAPA. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to use same conductive material of the first and third conductive layer in order to obtain a high conductivity of the interconnects

Response to Arguments

4. Applicant's arguments filed 04/28/2008 have been fully considered but they are not persuasive.

First, in response to applicant's argument on page 12 that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the memory element 200) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Second, in response to applicant's argument on page 12 that Young does not suggest arranging the conductive layer 210 in direct physical contact with the

conductive layer 110 and adhesion layer 112. The examiner disagrees. Young teaches the third conductive layer (38) is in direct physical contact with the second conductive layer (34) and the adhesion layer (36) within the opening in order to obtain a better electrical connection between second interconnection and the via (see col. 7, lines 20-35 and Fig. 3A).

Finally, Applicants' Figure 2 and Young's Figure 3A teach the third conductive layer cap the second conductive layer and the adhesion layer within the opening.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quoc Hoang whose telephone number is (571) 272-1780. The examiner can normally be reached on Monday-Friday from 8.00 AM to 5.00 PM.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao Le can be reached on (571) 272-1708. The fax phone numbers of the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Quoc D Hoang/

Primary Examiner, Art Unit 2892